To: Tina Laidlaw/MO/R8/USEPA/US@EPA[]
From: "Suplee, Mike"
Sent: Mon 2/13/2012 6:11:03 PM
Subject: DEQ12 and rule package-most recent
CircularDEQ12_v5.8.docx
Nutrient standards version 6.1.doc

Hi Tina;

This is your day; Claudia wrapped up her review so,

attached is version 5.8 of Circular DEQ12 for your review. You will see that most of it is in "Board Ready" form except for the Tables which we indicate in red text are still being worked on.

Also attached is the latest version of the rule package that would accompany DEQ12.

Please forward to Dave Moon as well.

Thanks,

Mike

P.S. Did I mention the Clark Fork River trend study with Dodds and Vicki and Chris just got accepted for publication last Thu.? Peer reviews were very favorable and the study lends a lot of support to the legitimacy of nutrient standards. Will probably come out in press (JAWRA) this summer.

DEPARTMENT CIRCULAR

DEQ-12, PARTS A and B

Montana Base Numeric Nutrient Standards and Nutrient Standards Variances

GENERAL INTRODUCTION

This circular contains information pertaining to the base numeric nutrients standards (§75-5-103[2], MCA) and their implementation. It is divided into **Parts A** and **B**. **Part A** contains the water quality standards including concentration limits, where they apply, and their period of application. **Part A** is adopted by the Board of Environmental Review under its rulemaking authority in §75-5-301(2), MCA.

Part B contains information about variances from the base numeric nutrient standards. This includes effluent treatment requirements associated with general nutrient standards variances, as well as effluent treatment requirements for individual nutrient standards variances and to whom these apply. **Part B** also contains the Department's definition of the total nitrogen (TN) and total phosphorus (TP) concentrations achievable at the limits of technology. Unlike **Part A**, **Part B** is not adopted by the Board of Environmental Review; **Part B** is adopted by the Department following its formal rule making process, pursuant to §75-5-313, MCA.

The Department has reviewed a considerable amount of scientific literature and has carried out scientific research on its own in order to derive the base numeric nutrient standards (see **References** in **Part A**). Because many of the base numeric nutrient standards are stringent and may be difficult for MPDES permit holders to meet in the short term, Montana's legislature adopted laws (e.g., §75-5-313, MCA) allowing for the achievement of the standards over time. This approach should allow time for nitrogen and phosphorus removal technologies to improve and become less costly, and to allow time for nonpoint sources of nitrogen and phosphorus pollution to be better addressed.

Circular DEQ-12, PART A

OCTOBER 2011 EDITION

1.0 Introduction

Elements comprising Circular DEQ-12, **Part A** are found below. These elements are adopted by the Montana Board of Environmental Review. The nitrogen and phosphorus concentrations provided here have been set at levels that should prevent instream exceedences of other surface water quality standards. The nitrogen and phosphorus concentrations also reflect the intent of the narrative standard at ARM 17.30.637(1)(e), and will preclude the need for case-by-case interpretations of the narrative standard.

1.1 Definitions

1. **Ecoregion** means mapped regions of relative homogeneity in ecological systems, derived from perceived patterns of a combination of causal and integrative factors including land use, land surface form, potential natural vegetation, soils, and geology. See also, endnote 1.

2. **Large river** means a perennial waterbody which has, during summer and fall baseflow (August 1 to October 31 each year), a wadeability index (product of river depth [in feet] and mean velocity [in ft/sec]) of 7.24 ft^2/sec or greater, a depth of 3.15 ft or greater, or a baseflow annual discharge of 1,500 ft^3/sec or greater. See also, endnote 4.

3. **Total nitrogen** means the sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined via persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

4. **Total phosphorus** means the sum of orthophosphates, polyphosphates, and organically bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

5. **Wadeable stream** means a perennial or intermittent stream in which most of the wetted channel is safely wadeable by a person during baseflow conditions.

2.0 Base Numeric Nutrient Standards

Table 12A-1 below shows the base numeric nutrient standards for Montana's wadeable streams and large rivers. Details on how these standards were derived can be found mainly in Addendum 1 of Suplee et al. (2008). Standards for wadeable streams are sub-grouped by ecoregion, either by level III (coarse scale) or level IV (fine scale). There is also a list of wadeable streams with reach-specific standards; these waterbodies have characteristics disimilar from those of the ecoregions in which they reside and have therefore been provided more specifically-applicable standards. **For the wadeable streams, the standards should be applied in this order: reach specific (if applicable) then level IV ecoregion (if applicable) then level III ecoregion.**

Table 12A-2 shows the base numeric nutrient standards for Montana's lakes and reservoirs. For lakes, these are sub-grouped by ecoregion, either by level III (coarse scale) or level IV (fine scale). Also listed are lakes with specific standards; these waterbodies have characteristics disimilar from those of the ecoregions in which they reside and have therefore been provided more specifically-applicable standards. Reservoir standards are developed case-by-case and are therefore all individually listed. **For the lakes, the standards should be applied in this order: lake specific (if applicable) then level IV ecoregion (if applicable) then level III ecoregion.**

Table 12A-1. Draft numeric nutrient standards for wadeable stream and large rivers. This table is not yet complete and values will change.

Waterbodies Criteria Apply to	Level III Ecoregion[1] (number)	Level IV Ecoregion[1] (number)	Period of Application	Numeric Nutrient Standard[2]		Related Assessment Information[3]
				Total P (µg/L)	Total N (µg/L)	
Wadable Streams-Reach Specific:						
Flint Creek (Georgetown Lake outlet to Clark Fork River	n/a	n/a	July 1-Sept 30	[]	[]	120 mg Chla/m^2 or 35 g AFDM/m^2
Clark Fork River from below the Warm Springs Creek confluence (46.1881, -112.7680) to the Bitterroot River confluence	n/a	n/a	July 1-Sept 30	20	300	100 mg Chl*a* /m^2 (summer mean); 150 mg Chl*a* /m^2 (summer maximum)
Wadeable Streams-by ecoregion:						
	Northern Rockies (15)		July 1-Sept 30	25	300	120 mg Chla/m^2 or 35 g AFDM/m^2
	Canadian Rockies (41)		July 1-Sept 30	25	300	120 mg Chla/m^2 or 35 g AFDM/m^2
	Middle Rockies (17)		July 1-Sept 30	30	300	120 mg Chla/m^2 or 35 g AFDM/m^2
		Absaroka -Gallatin Volcanic Mountains (17i)	July 1-Sept 30	130	250	120 mg Chla/m^2 or 35 g AFDM/m^2
	Idaho Batholith (16)		July 1-Sept 30	30	300	120 mg Chla/m^2 or 35 g AFDM/m^2
	Northwestern Glaciated Plains (42)		June 16-Sept 30	120	1100	
	Northwestern Great Plains (43)		July 1-Sept 30	120	1000	
		Non-calcareous Foothill Grassland (43s)	July 1-Sept 30	30	300	120 mg Chla/m^2 or 35 g AFDM/m^2
		Limy Foothill Grassland (43u)	July 1-Sept 30	35	350	120 mg Chla/m^2 or 35 g AFDM/m^2
Large Rivers [4]***:***						
Yellowstone River (Unit 3; Bighorn River confluence to Powder River confluence)	n/a	n/a	Aug 1 -Oct 31	90	700	
Yellowstone River (Unit 4; Powder River confluence to stateline)	n/a	n/a	Aug 1 -Oct 31	140	1000	
Clark Fork River from the Bitterroot River confluence to the Flathead River confluence	n/a	n/a	July 1-Sept 30	20	300	100 mg Chl*a* /m^2 (summer mean); 150 mg Chl*a* /m^2 (summer maximum)

[1] See endnote 1

[2] See endnote 2

[3] See endnote 3

[4] See endnote 4

12A-2. Numeric nutrient standards for lakes and reservoirs. This table is not yet complete.

Waterbodies Criteria Apply to	Level III Ecoregion[1] (number)	Level IV Ecoregion[1] (number)	Period of Application	Numeric Nutrient Standard[5] Total P (µg/L)	Numeric Nutrient Standard[5] Total N (µg/L)	Related Assessment Information[6]
Lakes-specific lakes:						
Flathead Lake	n/a	n/a	Year-round	[]	[]	Phytoplankton [] µg/l
Lakes-by ecoregion:						
	Middle Rockies (17)		Year-round	[]	[]	Phytoplankton [] µg/l
	Northern Rockies (15)		Year-round	[]	[]	Phytoplankton [] µg/l
	Canadian Rockies (41)		Year-round	[]	[]	Phytoplankton [] µg/l
	Idaho Batholith (16)		Year-round	[]	[]	Phytoplankton [] µg/l
Reservoirs						

[1] See endnote 1

[5] See endnote 5

[6] See endnote 6

2.1 Required Reporting Values for Base Numeric Nutrient Standards

Table 12A-3 presents the required reporting values for total phosphorus and total nitrogen measurements used to conform with the base numeric nutrient standards in this circular.

Table 12A-3. Required reporting values[a] for total nitrogen and phosphorus measurements. RRVs for these compounds are currently under review and will change.

Nutrient		Method of Measurement	Required Reporting Value
Total phosphorus		Persulfate digestion	5 µg/L
Total nitrogen		Persulfate digestion	40 µg/L
Total nitrogen	Sum of:	(a) total kjeldahl nitrogen	100 µg/L
		(b) nitrate + nitrite	See RRVs below
Nitrate- as N			10 µg/L
Nitrite- as N			10 µg/L
Nitrate + Nitrite-as N			10 µg/L

[a] See definition for required reporting values found in footnote 19 of Department Circular DEQ-7.

2.2 Developing Permit Limits for Base Numeric Nutrient Standards

For total nitrogen and total phosphorus, the critical low-flow for the design of disposal systems shall be based on the seasonal 14Q10 of the receiving water (see ARM 17.30.635[4]). When developing permit limits for base numeric nutrient standards, the Department will use an average monthly limit (AML) only, using methods appropriate for criterion continuous concentrations (i.e., chronic concentrations). Permit limits will be established using a value corresponding to the 95th percentile probability distribution of the effluent. The Department shall use methods that are appropriate for criterion continuous concentrations which are found in the document "*Technical Support Document for Water Quality-based Toxics Control*", Document No. EPA/505/2-90-001, United States Environmental Protection Agency, 1991.

3.0 Endnotes

(1) Ecoregions are based on the 2009 version (version 2) of the U.S. Environmental Protection Agency maps. These can be found at: http://www.epa.gov/wed/pages/ecoregions/mt_eco.htm . For Geographic Information System (GIS) use within DEQ, the GIS layers may be found at: L:\DEQ\Layers\Ecoregions.lyr

(2) No wadeable stream or large river referenced in **Table12A-1** shall have an average concentration that exceeds the values shown based upon a monthly (30-day) period.

(3) Algae density values refer to bottom-attached (benthic) algal chlorophyll *a* (Chl*a*) or ash free dry mass (AFDM) per square meter of stream bottom. These values are the arithmetic mean of between 10 and 20 replicates of benthic algae collected from a site during a sampling event. A site is a stream reach ≥ 100 m length or, for large rivers, may be a transect perpendicular to flow. For wadeable streams and large rivers, algae replicates must be collected in wadeable zones (depth ≤ 1 m) using a randomized approach or other, unbiased systematic approaches. Chl*a* and AFDM are used to assess the biomass of algae accumulated on the stream bottom; algae is stimulated by excess nitrogen and phosphorus levels and has been associated with impacts to recreational uses and impacts to stream dissolved oxygen levels, for example.

In the case of the Clark Fork River, the maximum summer algae value is the single greatest of any of the monthly means of the Chl*a* values at a given site. Therefore, there is only one month each summer representing the maximum. The summer mean is the arithmetic mean of the set of all replicates collected at a site during a given summer.

(4) **Table F-4** below shows the beginning and ending locations for large rivers in Montana.

Table F-4. Large river segments within the state of Montana.

River Name	Segment Description
Big Horn River	Yellowtail Dam to mouth
Clark Fork River	Bitterroot River to state-line
Flathead River	Origin to mouth
Kootenai River	Libby Dam to state-line
Madison River	Ennis Lake to mouth
Missouri River	Origin to state-line
South Fork Flathead River	Hungry Horse Dam to mouth
Yellowstone River	State-line to state-line

(5)) No lake or reservoir referenced in **Table12A-2** shall have an average concentration that exceeds the values shown based upon a monthly (30-day) period. The Department will determine on a case-by-case basis whether or not a permitted discharge to a stream or river is likely to be impacting a lake or reservoir. If yes, the permittee would be expected to meet its average monthly limit year round.

(6) Lake algae concentrations are expressed as micrograms chlorophyll *a* per L.

4.0 References

The following are citations for key scientific and technical literature used to derive the base numeric nutrient standards. This is not a complete list; rather, it contains the most pertinent citations. Many other articles and reports were reviewed during the development of the standards.

Biggs, B.J.F., 2000. New Zealand Periphyton Guideline: Detecting, Monitoring and Managing Enrichment in Streams. Prepared for the New Zealand Ministry of the Environment, Christchurch, 122 p.

Dodds, W.K., V.H. Smith, and B. Zander, 1997. Developing Nutrient Targets to Control Benthic Chlorophyll Levels in Streams: A Case Study of the Clark Fork River. Water Research 31: 1738-1750.

Dodds, W.K., V.H. Smith, and K. Lohman, 2002. Nitrogen and Phosphorus Relationships to Benthic Algal Biomass in Temperate Streams. Canadian Journal of Fisheries and Aquatic Sciences 59: 865-874.

Dodds, W.K, V.H. Smith, and K. Lohman, 2006. Erratum: Nitrogen and Phosphorus Relationships to Benthic Algal Biomass in Temperate Streams. Canadian Journal of Fisheries and Aquatic Sciences 63: 1190-1191.

Elser, J.J., M.E.S. Bracken, E.E. Cleland, D.S. Gruner, W.S. Harpole, H. Hillebrand, J.T. Ngai, E.W.

Seabloom, J.B. Shurin, and J.E. Smith, 2007. Global Analysis of Nitrogen and Phosphorus Limitation of Primary Producers in Freshwater, Marine and Terrestrial Ecosystems. Ecology Letters 10: 1135-1142.

Flynn, K., and M.W. Suplee, 2010. Defining Large Rivers in Montana using a Wadeability Index. Helena, MT: Montana Department of Environmental Quality, 14 p.

Flynn, K., and M.W. Suplee, 2011. *Draft*. Using a Computer Water Quality Model to Derive Numeric Nutrient Criteria. Lower Yellowstone River, MT. WQPBMSTECH-22. Helena, MT: Montana Department of Environmental Quality, 274 p plus appendices.

McCarthy, P.M., 2005. Statistical Summaries of Streamflow in Montana and Adjacent Areas, Water years 1900 through 2002. U.S. Geological Survey Scientific Investigations Report 2004-5266, 317 p.

Omernik, J.M., 1987. Ecoregions of the Conterminous United States. Annals of the Association of American Geographers 77: 118-125.

Smith, R.A., R.B. Alexander, and G.E. Schwarz, 2003. Natural Background Concentrations of Nutrients in Streams and Rivers of the Conterminous United States. Environmental Science and Technology 37: 3039-3047.

Sosiak, A., 2002. Long-term Response of Periphyton and Macrophytes to Reduced Municipal Nutrient Loading to the Bow River (Alberta, Canada). Canadian Journal of Fisheries and Aquatic Sciences 59: 987-1001.

Stevenson, R.J, S.T. Rier, C.M. Riseng, R.E. Schultz, and M.J. Wiley, 2006. Comparing Effects of Nutrients on Algal Biomass in Streams in Two Regions with Different Disturbance Regimes and with Applications for Developing Nutrient Criteria. Hydrobiologia 561: 149-165.

Suplee, M., R. Sada de Suplee, D. Feldman, and T. Laidlaw, 2005. Identification and Assessment of Montana Reference Streams: A Follow-up and Expansion of the 1992 Benchmark Biology Study. Helena, MT: Montana Department of Environmental Quality, 41 p.

Suplee, M.W., A. Varghese, and J. Cleland, 2007. Developing Nutrient Criteria for Streams: An Evaluation of the Frequency Distribution Method. Journal of the American Water Resources Association 43: 453-472.

Suplee, M.W., V. Watson, A. Varghese, and J. Cleland, 2008. Scientific and Technical Basis of the Numeric Nutrient Criteria for Montana's Wadeable Streams and Rivers, ***and Addendums***. Helena, MT: Montana Department of Environmental Quality, 86 p.

Suplee, M.W., V. Watson, M. Teply, and H. McKee, 2009. How Green is too Green? Public Opinion of what Constitutes Undesirable Algae Levels in Streams. Journal of the American Water Resources Association 45: 123-140.

Suplee, M.W., and R. Sada de Suplee, 2011. Assessment Methodology for Determining Wadeable

Stream Impairment Due to Excess Nitrogen and Phosphorus Levels. Helena, MT: Montana Department of Environmental Quality

Suplee, M.W., V. Watson, W.K, Dodds, and C. Shirley, 2012. Response of Algal Biomass to Large Scale Nutrient Controls on the Clark Fork River, Montana, U.S.A. Journal of the American Water Resources Association- IN PRESS.

U.S. Environmental Protection Agency, 2000a. Nutrient Criteria Technical Guidance Manual, Rivers and Streams. United States Environmental Protection Agency, EPA-822-B00-002. Washington, D.C.

U.S. Environmental Protection Agency, 2000b. Nutrient Criteria Technical Guidance Manual, Lakes and Reservoirs. United States Environmental Protection Agency, EPA-822-B00-001. Washington, D.C.

Varghese, A., and J. Cleland, 2005. Seasonally Stratified Water Quality Analysis for Montana Rivers and Streams-Final Report. Prepared by ICF International for the Montana Department of Environmental Quality, 44 p plus appendices.

Varghese, A., J. Cleland, and B. Dederick, 2008. Updated Statistical Analyses of Water Quality Data, Compliance Tools, and Changepoint Assessment for Montana Rivers and Streams. Prepared by ICF International for the Montana Department of Environmental Quality under agreement No. 205031, task order 5.

Woods, A.J., J.M. Omernik, J.A. Nesser, J. Shelden, J.A. Comstock, and S. J. Azevedo, 2002. Ecoregions of Montana, 2nd edition. (Color Poster with Map, Descriptive Text, Summary Tables, and Photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Circular DEQ-12, PART B

OCTOBER 2011 EDITION

1.0 Introduction

Elements comprising Circular DEQ-12**, Part B** are found below. These elements are adopted by the Department following the Department's formal rule making process. Montana state law (§75-5-103 [22], MCA and 75-5-313, MCA) allows for variances from the base numeric nutrient standards (found in **Part A** of this circular) based on a determination that base numeric nutrient standards cannot be achieved because of economic impacts or because of the limits of technology.

1.1 Definitions

1. **Limits of technology** means wastewater treatment processes for the removal of nitrogen and phosphorus compounds from wastewater that can achieve a concentration of 70 µg TP/L and 4,000 µg TN/L.

2. **Long-term average** means a description of effluent data from a treatment system using standard descriptive statistics and an assumption that the data follow a lognormal distribution. See also, "*Technical Support Document for Water Quality-based Toxics Control*", Document No. EPA/505/2-90-001, United States Environmental Protection Agency, 1991.

2.0 General Nutrient Standards Variances

Because the treatment of wastewater to base numeric nutrient standards in 2011 would have resulted in substantial and widespread economic impacts on a statewide basis (§75-5 -313 [5][a], MCA), a permittee who meets the end-of-pipe treatment requirements provided below in **Table 12B-1** may apply for and will receive a general nutrient standards variance ("general variance")(§75-5 -313 [5][b], MCA). A person may apply for a general variance for either total phosphorus or total nitrogen, or both. The general variance may be established for a period not to exceed 20 years. A compliance schedule to meet the treatment requirements shown in the table will be established on a case-by-case basis.

Cases will arise in which a permittee is or will be discharging effluent with N and/or P concentrations lower than (i.e., superior to) the minimum requirements of a general variance. And yet, the resulting concentrations outside of the mixing zone still exceed the base numeric nutrient standards. Such discharges are still within the scope of the general variance, because statute indicates that a general variance is allowable if the permittee treats the discharge to, **at a minimum**, the concentrations indicated by §75-5-313(5)(b)(i)and (ii), MCA. Thus, permitted discharges better than those at §75-5-313(5)(b)(i)and (ii), MCA are not precluded from falling under a general variance.

Table 12B-1. General variance end-of-pipe treatment requirements per §MCA 75-5 -313(5)(b), through May 2016.

	Long-term Average	
Discharger Category[1]	**Total P (µg/L)**	**Total N (µg/L)**
≥ 1.0 million gallons per day	1,000	10,000
< 1.0 million gallons per day	2,000	15,000
Lagoons not designed to actively remove nutrients	Maintain current performance	Maintain current performance

[1] See endnote 1

The Department must review the general variance treatment requirements every 3 years to assure that the justification for their adoption remains valid. If a low-cost technological innovation for lowering nitrogen and phosphorus concentrations in effluent were to be developed in the near future, for example, the Department could (after May 2016) make more stringent the concentrations shown in the table. If the Department were to adopt general variance treatment requirements more stringent than those provided in **Table 12B-1**, the permittee will be expected to meet the updated concentration(s) during the next permit cycle in order to continue to hold the general variance.

Only after changes in specified factors had occurred would the general variance treatment requirements be made more stringent. The review will occur triennially and would generally be carried out at a fairly coarse level (i.e., statewide). The Department and the Nutrient Work Group may consider whether or not:

1. Wastewater treatment technologies and costs for nutrient removal have improved
2. A substantial number of TMDLs had been developed and implemented
3. Nonpoint source BMPs had been widely applied
4. Montana's economic status had changed sufficiently to make treatment more affordable
5. Base numeric nutrient standards should be revised to reflect N- or P-compound speciation and bioavailability
6. Nutrient trading options had been implemented where feasible

2.1 Wastewater Facility Optimization Study

Permitees receiving a general variance are required to evaluate current facility operations to optimize nutrient reduction with existing infrastructure and shall analyze cost-effective methods of reducing nutrient loading, including but not limited to nutrient trading without substantial investment in new infrastructure (§75-5-313[9][a], MCA). The Department may request the results of the optimization/nutrient reduction analysis within two years of granting a general variance to a permittee.

Changes to facility operations resulting from the analysis carried out per the above paragraph are only intended to be refinements to the system already in place. Therefore, optimizations should:

1. Address only changes to facility operation and maintenance and not structural changes
2. Not result in rate increases
3. Must include exploration of the feasibility of nutrient trading within the basin

Who and how the analysis is carried out is to be decided by the permittee. The Department encourages the use of a third-party firm with expertise in this subject.

3.0 Individual Nutrient Standards Variances

Montana law allows for the granting of nutrient standards variances based on the particular economic and financial conditions of a permittee (§75-5-313 [1], MCA). Individual nutrient standards variances ("individual variances") may be granted on a case-by-case basis because the attainment of the base numeric nutrient standards is precluded due to economic impacts, limits of technology, or both. In general, individual variances are intended for permittees who would have financial difficulties meeting even the general variance concentrations, and are seeking individual N and P permit limits tailored to their specific economic situation.

Unlike the general variances presented in **Section 2.0** above, individual variances may only be granted to a permittee after the permittee has made a demonstration to the Department of economic impacts, the limits of technology, or both. The Department, in conjunction with the Nutrient Work Group, has developed as assessment process that must be completed. The assessment process is found in the Department guidance document "*Carrying out a Substantial and Widespread Economic Analysis for Individual Nutrient Standards Variances*".

A permittee, using the assessment process referred to above, must also demonstrate to the Department that there are no reasonable alternatives (including but not limited to trading, compliance schedules, reuse, recharge, and land application) that would allow compliance with the base numeric nutrient standards. If no reasonable alternatives exist, then an individual variance is justifiable and becomes effective and may be incorporated into a permit following the Department's formal rule making process.

Individual variances the Department may adopt in the future will be documented in **Table 12B-2** below.

Table 12B-2. Table for individual variances that may be adopted.

MPDES Number	Facility Name	Discharge Latitude	Discharge Longitude	Receiving Waterbody	Receiving Waterbody Classification	Long-term Average Total P (µg/L)	Long-term Average Total N (µg/L)	Start Date	Sunset Date (maximum)	Review Schedule (year)	Review Outcome

4.0 Endnotes

(1) Based on facility design flow.

NEW RULE I: NUTRIENT STANDARDS VARIANCES

(1) A person may apply to the department for an individual, general, or alternative nutrient standards variance at any time prior to or following the board's adoption of base numeric nutrient standards.
(2) An application for an individual variance must provide adequate demonstration that there are no reasonable alternatives that eliminate the need for a variance and that attainment of the base numeric nutrient standards is precluded due to economic impacts, the limits of technology, or both. If the demonstration relies upon economic impacts, the demonstration must be consistent with the guidelines developed by the department and the nutrient work group, as provided in 75-5-313(2), MCA.
(3) The department shall review each application for an individual variance to determine whether a reasonable alternative, such as trading, a permit compliance schedule, a general variance, an alternative variance, reuse, recharge, or land application would eliminate the need for an individual variance. If the department makes a preliminary finding that a reasonable alternative to approving an individual variance is available, the department shall consult with the applicant prior to making a final decision to approve or deny the individual variance.
(4) If, after consultation with the applicant, the department determines that no reasonable alternative to an individual variance exists, the department must determine whether the information provided by the applicant in (2) adequately demonstrates that attaining the base numeric nutrient standards is not feasible. If the department finds that attaining the base numeric nutrient standards is not feasible, the department shall approve an individual variance, which will become effective and incorporated into the applicant's permit only after adoption by the department in a formal rulemaking proceeding.
(5)An application for a general variance must provide information demonstrating that the wastewater treatment facility meets the requirements of 75-5-313(5)(b), MCA.
(6) An application for an alternative variance must demonstrate that the nutrient concentrations established in an individual or general variance would result in an insignificant reduction of nutrient loading in the receiving stream.

17.30.602 DEFINITIONS In this subchapter the following terms have the meaning indicated below and are supplemental to the definitions given in 75-5-303, MCA:

(1) through (15) remain the same.

(16) "Limits of technology" means wastewater treatment processes for the removal of nitrogen and phosphorus compounds from wastewater that can achieve a concentration of 70 micrograms of total phosphorus per liter and 4,000 micrograms of total nitrogen per liter.

(16) through (34) remain the same but are renumbered (17) through (35).

~~(35)~~ (36) "Total nitrogen" means the ~~total nitrogen concentration (as N) of unfiltered water. This may be determined by direct methods, or derived as the sum of the soluble (as N) and non-soluble (as N) nitrogen fractions. The filter used to separate the soluble and non-soluble fractions must be 0.45 µm~~ sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined by persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

~~(36)~~ (37) "Total phosphorus" means the ~~total phosphorus concentration (as P) of unfiltered water~~ sum of orthophosphates, polyphosphates, and organically

bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

(37) through (40) remain the same but are renumbered (38) through (41).

~~(41)~~ (42) "DEQ-7" means the department circular that is adopted and incorporated by reference in ARM 17.30.619 and is entitled "Montana Numeric Water Quality Standards." This circular establishes water quality standards for toxic, carcinogenic, bioconcentrationg, ~~nutrient~~, radioactive, and harmful parameters, and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate, nitrate + nitrite, and nitrite.

(43) "DEQ-12" means the department circular that is adopted and incorporated by reference in ARM 17.30.619 and is entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances" This circular contains numeric water quality standards for total nitrogen and total phosphorus in surface waters and also contains variances from those standards.

17.30.619 INCORPORATIONS BY REFERENCE (1) The board adopts and incorporates by reference the following state and federal requirements and procedures as part of Montana's surface water quality standards:

(a) Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part A (March 2012 edition), which establishes numeric water quality standards for total nitrogen and total phosphorus in surface waters;

~~(a)~~ (b) Department Circular DEQ-7, entitled "Montana Numeric Water Quality Standards" (August 2010 edition), which establishes water quality standards for toxic, carcinogenic, bioconcentrating, ~~nutrient,~~ and harmful parameters and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate; nitrate + nitrite; and nitrite;

(b) through (f) remain the same but are renumbered (c) through (g).

(2) The department adopts and incorporates by reference the following as part of Montana's surface water quality standards:

Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part B (March 2012 edition), which establishes variances from the numeric water quality standards for total nitrogen and total phosphorus in surface waters adopted by the board in Part A of Department Circular DEQ-12.

(2) remains the same but is renumbered (3).

17.30.622 A-1 CLASSIFICATION STANDARDS (1) through (2) remain the same.

(3) No person may violate the following specific water quality standards for waters classified A-1:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards contained in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.623 B-1 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-1:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.624 B-2 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-2:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.625 B-3 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-3:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.626 C-1 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-1:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.627 C-2 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-2:

(a) through (h) remains the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.628 I CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified I:

(a) through (i) remain the same.

(j) Beneficial uses are considered supported when the concentrations of toxic, carcinogenic, or harmful parameters in these waters do not exceed the applicable standards specified in department Circular DEQ-7 and DEQ-12 when stream flows equal or exceed the flows specified in ARM 17.30.635(4) or, alternatively, for aquatic life when site-specific criteria are adopted using the procedures given in 75-5-310, MCA. The limits shall be used as water quality standards for the affected waters and as the basis for permit limits instead of the applicable standards in department Circular DEQ-7.

(k) Limits for toxic, carcinogenic, or harmful parameters in new discharge permits issued pursuant to the MPDES rules (ARM Title 17, chapter 30, subchapter 13) are the larger of either the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12, site-specific standards or one-half of the mean in-stream concentrations immediately upstream of the discharge point.

17.30.629 C-3 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-3:

(a) through (h) remain the same.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.631 NUMERIC ALGAL BIOMASS AND NUTRIENT STANDARDS

~~(1) No person may violate the numeric water quality standards identified below.~~

~~(2) The numeric nutrient and standing crop of benthic algae water quality standards for the mainstem Clark Fork River from below the Warm Springs Creek confluence (N46º11'17", W112º46'03") to the confluence with the Flathead River (N47º21'45", W114º46'43") are as follows:~~

~~(a) In the mainstem Clark Fork River from below the Warm Springs Creek confluence (N46º11'17", W112º46'03") to the confluence with the Blackfoot River (N46º52'19", W113º53'35") the numeric water quality standards for Total Nitrogen, Total Phosphorus, and benthic algal chlorophyll a, applicable from June 21 to September 21, are as follows:~~

~~(i) Parameter~~ ~~Concentration~~

~~Total Phosphorus as P 20 µg/L~~
~~Total Nitrogen as N 300 µg/L~~
~~(ii) Parameter Density~~
~~(Summer mean) - Benthic algal chlorophyll a 100 mg/square meter~~
~~(Maximum) - Benthic algal chlorophyll a 150 mg/square meter~~

~~(b) In the Clark Fork River from the confluence with the Blackfoot River (N46º52'19", W113º53'35") to the confluence with the Flathead River (N47º21'45", W114º46'43") the numeric water quality standards for Total Nitrogen, Total Phosphorus, and benthic algal chlorophyll a, applicable from June 21 to September 21, are as follows:~~

~~(i) Parameter Concentration~~
~~Total Phosphorus as P 39 µg/L~~
~~Total Nitrogen as N 300 µg/L~~
~~(ii) Parameter Density~~
~~(Summer mean) - Benthic algal chlorophyll a 100 mg/square meter~~
~~(Maximum) - Benthic algal chlorophyll a 150 mg/square meter~~

17.30.635 GENERAL TREATMENT STANDARDS (1) through (3) remain the same.

(4) For design of disposal systems, stream flow dilution requirements must be based on the minimum consecutive seven-day average flow which may be expected to occur on the average of once in 10 years. When dilution flows are less than the above design flow at a point discharge, the discharge is to be governed by the permit conditions developed for the discharge through the waste discharge permit program. If the flow records on an affected surface water are insufficient to calculate a 10-year seven-day low flow, the department shall determine an acceptable stream flow for disposal system design. ~~The department shall determine the acceptable stream flow for disposal system design for controlling nitrogen and phosphorus concentrations.~~ For total nitrogen and total phosphorus, the stream flow dilution requirements must be based on the seasonal 14Q10, which is the lowest average 14 consecutive day low flow, occurring from July through October, with an average recurrence frequency of once in 10 years.

17.30.702 DEFINITIONS The following definitions, in addition to those in 75-5-103, MCA, apply throughout this subchapter (Note: 75-5-103, MCA, includes definitions for "base numeric nutrient standards," "degradation," "existing uses," "high quality waters," "mixing zone," and "parameter"):

(1) through (16) remain the same.

~~(17) "Nutrients" means total inorganic phosphorus and total inorganic nitrogen.~~

(18) through (21) remain unchanged but are renumbered (17) through (20).

~~(22)~~ (21) "Reporting values (RRV)" means the detection level that must be achieved in reporting surface water or ground water monitoring or compliance data to the department unless otherwise specified in a permit, approval, or authorization issued by the department. The RRV is the department's best determination of a level of analysis that can be achieved by the majority of commercial, university, or

governmental laboratories using EPA approved methods or methods approved by the department. The RRV is listed in Circular DEQ-7, Part A of Circular DEQ-12, and the definition of total inorganic phosphorus.

(23) remains the same but is renumbered (22).

(23) "Total inorganic phosphorus" means the sum of all orthophosphates, as P, in an unfiltered water sample. Total inorganic phosphorus may also be determined by direct colorimetry. The RRV for total inorganic phosphorus is 1 microgram per liter.

(24) "Total nitrogen" means the sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined by persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

(25) "Total phosphorus" means the sum of orthophosphates, polyphosphates, and organically bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

(24) through (25) remain the same but are renumbered (26) and (27).

~~(26)~~ (28) The board adopts and incorporates by reference:

(a) Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part A (March 2012 edition), which establishes numeric water quality standards for total nitrogen and total phosphorus in surface waters.

~~(a)~~ (b) Department Circular DEQ-7, entitled "Montana Numeric Water Quality Standards" (August 2010 edition), which establishes water quality standards for toxic, carcinogenic, bioconcentrating, ~~nutrient,~~ radioactive, and harmful parameters and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate; nitrate + nitrite, and nitrite;

(b) through (d) remain the same but are renumbered (c) through (e).

17.30.715 CRITERIA FOR DETERMINING NONSIGNIFICANT CHANGES IN WATER QUALITY (1) The following criteria will be used to determine whether certain activities or classes of activities will result in nonsignificant changes in existing water quality due to their low potential to affect human health or the environment. These criteria consider the quantity and strength of the pollutant, the length of time the changes will occur, and the character of the pollutant. Except as provided in (2), changes in existing surface or ground water quality resulting from the activities that meet all the criteria listed below are nonsignificant, and are not required to undergo review under 75-5-303, MCA:

(a) activities that would increase or decrease the mean monthly flow of a surface water by less than 15% or the seven-day 10 year low flow by less than 10%;

(b) discharges containing carcinogenic parameters or parameters with a bioconcentration factor greater than 300 at concentrations less than or equal to the concentrations of those parameters in the receiving water;

(c) discharges containing toxic parameters ~~or nutrients, except as specified in (1)(d) and (e)~~, which will not cause changes that equal or exceed the trigger values in department Circular DEQ-7. Whenever the change exceeds the trigger value, the change is not significant if the resulting concentration outside of a mixing zone designated by the department does not exceed 15% of the lowest applicable standard;

(d) discharges to surface waters containing total nitrogen and total phosphorus when the resulting concentration outside of a mixing zone designated by

the department does not exceed 50% of the base numeric nutrient standards for these parameters.

(d) through (g) remain the same but are renumbered (e) through (h).